

Day : Monday  
Date: 5/23/2005

# PALM INTRANET

Time: 13:31:32

## Inventor Name Search Result

Your Search was:

Last Name = FREIDHOF

First Name = MARKUS

Application#	Patent#	Status	Date Filed	Title	Inventor Name 9
<u>11102957</u>	Not Issued	019	04/12/2005	SIGNAL-PROCESSING DEVICE	FREIDHOF, MARKUS
<u>10761136</u> ✓	Not Issued	030	01/20/2004	SIGNAL DELAYING DEVICE AND METHOD FOR DYNAMIC DELAYING OF A DIGITALLY SAMPLED SIGNAL	FREIDHOF, MARKUS
<u>10607751</u> ✓	Not Issued	080	06/27/2003	PROCEDURE AND APPARATUS FOR THE DETERMINATION OF THE NOISE LEVEL OF AN ELECTRONIC OBJECT TO BE MEASURED	FREIDHOF, MARKUS
<u>10321829</u> ✓	Not Issued	030	12/16/2002	METHOD AND DEVICE FOR GENERATING AN OUTPUT SIGNAL AS A MATHEMATICAL FUNCTION OF AN INPUT SIGNAL	FREIDHOF, MARKUS
<u>10072894</u> ✓	6518894	150	02/12/2002	DEVICE AND METHOD FOR SAMPLING RATE CONVERSION	FREIDHOF, MARKUS
<u>10062134</u> ✓	6636165	150	02/01/2002	DEVICE AND METHOD FOR CONVERSION OF SAMPLING RATE	FREIDHOF, MARKUS
<u>10061700</u> ✓	6624765	150	02/01/2002	APPARATUS AND METHOD FOR SAMPLING RATE CONVERSION	FREIDHOF, MARKUS
<u>10045161</u> ✓	6559781	150	01/15/2002	DEVICE AND METHOD FOR SAMPLING RATE CONVERSION	FREIDHOF, MARKUS
<u>09928402</u> ✓	Not Issued	071	08/14/2001	METHOD AND APPARATUS FOR ESTIMATING THE FREQUENCY AND/OR PHASE OF A DIGITAL SIGNAL	FREIDHOF, MARKUS

## Inventor Search Completed: No Records to Display.

---

	Last Name	First Name	
<b>Search Another: Inventor</b>	<input type="text" value="FREIDHOF"/>	<input type="text" value="MARKUS"/>	<input type="button" value="Search"/>

To go back use Back button on your browser toolbar.

Back to [PALM](#) | [ASSIGNMENT](#) | [OASIS](#) | [Home page](#)

5

wave pulse response is generated twice ( $h_3(k)$  and  $h_4(k)$ ), and square-wave pulse responses ( $h_3(k)$  and  $h_4(k)$ ) are folded together so that the elements 9, 10, 5a, 11, 12 generate the triangular pulse response  $h_1(k)$  shown in FIG. 5 on the whole. By sending the output signal of the second differentiator 12 to the averaging filter 13, there is a folding with the Dirac pulses of the pulse response of the averaging filter 13, so that the triangular pulse response  $h_1(k)$  is added to the triangular sequence offset by the period  $\frac{1}{3} T_{a2}$  (offset by 40 sampling times in the embodiment illustrated in FIGS. 5 and 6). The two overlapping triangular pulse responses  $h_1(k)$  and  $h_2(k)$  shown in FIGS. 5 and 6 then yield the desired resulting trapezoidal pulse response  $h_M(k)$  shown in FIG. 4.

The block diagrams shown in FIGS. 1 and 2 serve only to illustrate one embodiment of this invention. Elements 1 through 13 are preferably implemented in the circuitry (as hardware). However, implementation in the form of program steps (as software) is also conceivable.

What is claimed is:

1. A method of estimating a frequency  $\hat{f}$  of a digital input signal  $x(k)$ , comprising the steps of:

determining (2) a phase ( $\phi(k)=\arg(x(k))$ ) of the input signal  $x(k)$ ,

generating (3) a phase difference ( $\phi_{diff}(k)$ ) between adjacent samples of a phase ( $\phi(k)$ ,  $\phi(k-1)$ ),

averaging the phase difference ( $\phi_{diff}(k)$ ) by using a filter (4) which has a trapezoidal pulse response ( $h_M(k)$ ), wherein the trapezoidal pulse response ( $h_M(k)$ ) is generated by superimposing a first triangular pulse response ( $h_1(k)$ ) on a second triangular pulse response ( $h_2(k)$ ) which is offset in time in comparison with the first triangular pulse response ( $h_1(k)$ ).

2. The method according to claim 1, wherein the first triangular pulse response ( $h_1(k)$ ) is generated by folding two square-wave pulse responses ( $h_3(k)$ ,  $h_4(k)$ ).

3. The method according to claim 2, wherein the second triangular pulse response ( $h_2(k)$ ) is generated by folding the first triangular pulse responses ( $h_1(k)$ ).

6

4. The method according to claim 3, wherein the square-wave pulse responses ( $h_3(k)$ ,  $h_4(k)$ ) are generated by integration (9, 10) and subsequent differentiation (11, 12), where a sampling rate ( $f_{a1}$ ) is reduced between integration (9) and differentiation (11) to one third of the inverse of the period ( $f_{a1}=\frac{1}{3} \cdot 1/T_{a2}$ ) of the trapezoidal pulse response ( $h_M(k)$ ) of the filter (4).

5. The method according to claim 4, wherein the square-wave pulse responses ( $h_3(k)$ ,  $h_4(k)$ ) are folded by performing the integration (9, 10) and differentiation (11, 12) each in two stages.

6. A device for estimating the frequency ( $\hat{f}$ ) of a digital input signal  $x(k)$ , comprising:

a phase determination device (2) for determining a phase ( $\phi(k)=\arg(x(k))$ ) of the input signal  $x(k)$ ,

a differentiator (3) for generating a phase difference ( $\phi_{diff}(k)$ ) between adjacent samples of a phase ( $\phi(k)$ ,  $\phi(k-1)$ ),

a filter (4) which has a trapezoidal pulse response ( $h_M(k)$ ) and averages the phase difference ( $\phi_{diff}(k)$ ), wherein the filter (4) has a first integrator (9), a second integrator (10) downstream from the first integrator (9), a sample converter (5a) downstream from the second integrator (10), a first differentiator (11) downstream from the sample converter (5a), a second differentiator (12) downstream from the first differentiator (11), and an averaging filter (13) downstream from the second differentiator (12).

7. The device according to claim 6, wherein a sampling rate ( $f_{a1}$ ) is reduced in the sample converter (5a) to one third of the inverse of the period ( $f_{a1}=\frac{1}{3} \cdot 1/T_{a2}$ ) of the trapezoidal pulse response ( $h_M(k)$ ) of the filter (4).

8. The device according to claim 6, wherein a transfer function  $H_K(Z)$  of the averaging filter (13) amounts to:

$$H_K(Z)=\frac{1}{2}(1+Z^{-1}).$$

\* \* \* \* \*

Day : Monday  
Date: 5/23/2005

**PALM INTRANET**

Time: 13:40:20

## Inventor Name Search Result

Your Search was:

Last Name = SCHMIDT

First Name = KURT

Application#	Patent#	Status	Date Filed	Title	Inventor Name 50
<u>60106845</u>	Not Issued	159	11/03/1998	METHOD AND APPARATUS FOR QUALIFYING LOOPS FOR DATA SERVICES	SCHMIDT, KURT E.
<u>60064598</u>	Not Issued	159	11/06/1997	ELECTRONIC OVERSPEED PROTECTION SYSTEM	SCHMIDT, KURT A.
<u>60039282</u>	Not Issued	159	03/03/1997	OPEN ARCHITECTURE CARDIOLOGY INFORMATION SYSTEM	SCHMIDT, KURT
<u>11102957</u>	Not Issued	019	04/12/2005	SIGNAL-PROCESSING DEVICE	SCHMIDT, KURT
<u>11060904</u>	Not Issued	030	02/18/2005	PREDICTING PERFORMANCE OF TELEPHONE LINES FOR DATA SERVICES	SCHMIDT, KURT E.
<u>10885507</u>	Not Issued	030	07/03/2004	AIDED LOCATION COMMUNICATION SYSTEM	SCHMIDT, KURT CHRISTIAN
<u>10774609</u>	Not Issued	041	02/10/2004	APPARATUS AND METHOD FOR SEALING THE JUNCTION WHERE A BRANCH LINE JOINS A HEADER	SCHMIDT, KURT
<u>10761136</u>	Not Issued	030	01/20/2004	SIGNAL DELAYING DEVICE AND METHOD FOR DYNAMIC DELAYING OF A DIGITALLY SAMPLED SIGNAL	SCHMIDT, KURT
<u>10712766</u>	Not Issued	030	11/12/2003	METHOD AND ANALYZING DEVICE FOR ANALYZING AN OFDM SIGNAL	SCHMIDT, KURT
<u>10700821</u>	Not Issued	041	11/04/2003	SATELLITE BASED POSITIONING METHOD AND SYSTEM FOR COARSE LOCATION POSITIONING	SCHMIDT, KURT CHRISTIAN
<u>10680902</u>	Not Issued	030	10/08/2003	BONE-CUTTING APPARATUS	SCHMIDT, KURT
<u>10607751</u>	Not	080	06/27/2003	PROCEDURE AND	SCHMIDT, KURT

	Issued			APPARATUS FOR THE DETERMINATION OF THE NOISE LEVEL OF AN ELECTRONIC OBJECT TO BE MEASURED	
<u>10362427</u>	Not Issued	041	03/21/2003	METHOD FOR PLACING OBJECTS ON THE INNER WALL OF A PLACED SEWER PIPE AND DEVICE FOR CARRYING OUT SAID METHOD	SCHMIDT, KURT
<u>10301685</u>	Not Issued	030	11/22/2002	METHOD FOR SHARED ESTIMATION OF PARAMETERS	SCHMIDT, KURT
<u>10253059</u>	Not Issued	030	09/25/2002	METHOD FOR DETERMINING A TIME OFFSET OF A CDMA SIGNAL	SCHMIDT, KURT
<u>10209708</u>	Not Issued	030	08/01/2002	PROCEDURE FOR THE ESTIMATION OF PARAMETERS OF A CDMA-SIGNAL	SCHMIDT, KURT
<u>10185600</u>	Not Issued	168	06/27/2002	DISTRIBUTION AND RECONSTRUCTION OF AD-HOC TIMING SIGNALS	SCHMIDT, KURT E.
<u>10169849</u>	Not Issued	030	07/10/2002	METHOD OF DETERMINING PARAMETERS OF AN N-GATE	SCHMIDT, KURT
<u>10091037</u>	Not Issued	077	03/06/2002	INTERPOLATOR	SCHMIDT, KURT
<u>10062563</u>	<u>6763323</u>	150	02/05/2002	RESOLUTION FILTER FOR A SPECTRUM ANALYZER	SCHMIDT, KURT
<u>10061700</u>	<u>6624765</u>	150	02/01/2002	APPARATUS AND METHOD FOR SAMPLING RATE CONVERSION	SCHMIDT, KURT
<u>10045161</u>	<u>6559781</u>	150	01/15/2002	DEVICE AND METHOD FOR SAMPLING RATE CONVERSION	SCHMIDT, KURT
<u>10012543</u>	Not Issued	168	10/08/2001	PROCESS FOR LAYING AT LEAST ONE LEAD AND/OR EMPTY PIPE ALONG THE INSIDE WALL OF A LAID SEWER PIPE AND A DEVICE FOR CARRYING OUT SUCH A PROCESS	SCHMIDT, KURT
<u>09985137</u>	Not Issued	030	11/01/2001	METHOD FOR SYNCHRONIZATION OF A	SCHMIDT, KURT

				CDMA-SIGNAL	
<u>09928402</u>	Not Issued	071	08/14/2001	METHOD AND APPARATUS FOR ESTIMATING THE FREQUENCY AND/OR PHASE OF A DIGITAL SIGNAL	SCHMIDT, KURT
<u>09915502</u>	Not Issued	092	07/27/2001	PROCESS AND APPARATUS FOR CORRECTION OF A RESAMPLER	SCHMIDT, KURT
<u>09901644</u>	6407684	150	07/11/2001	METHOD AND DEVICE FOR ESTIMATING THE FREQUENCY OF A DIGITAL SIGNAL	SCHMIDT, KURT
<u>09598595</u>	6590962	150	06/21/2000	METHOD OF PERFORMING NON-INTERACTIVE RESISTIVE FAULT LOCATION	SCHMIDT, KURT H.
<u>09575492</u>	6671620	150	05/18/2000	METHOD AND APPARATUS FOR DETERMINING GLOBAL POSITION USING ALMANAC INFORMATION	SCHMIDT, KURT CHRISTIAN
<u>09410236</u>	6741676	150	09/30/1999	DETERMINING THE PHYSICAL STRUCTURE OF SUBSCRIBER LINES	SCHMIDT, KURT E.
<u>09410222</u>	6389109	150	09/30/1999	FAULT CONDITIONS AFFECTING HIGH SPEED DATA SERVICES	SCHMIDT, KURT E.
<u>09294563</u>	6895081	150	04/20/1999	PREDICTING PERFORMANCE OF TELEPHONE LINES FOR DATA SERVICES	SCHMIDT, KURT E.
<u>09285954</u>	6385297	150	04/02/1999	METHOD AND APPARATUS FOR QUALIFYING LOOPS FOR DATA SERVICES	SCHMIDT, KURT E.
<u>09211338</u>	6026145	150	12/14/1998	METHOD AND APPARATUS FOR FAULT SEGMENTATION IN A TELEPHONE NETWORK	SCHMIDT, KURT E.
<u>09187707</u>	6075685	150	11/06/1998	SPEED PROTECTION SYSTEM FOR A MACHINE AND A METHOD THEREOF	SCHMIDT, KURT ARNE
<u>08965360</u>	5870451	150	11/06/1997	METHOD AND APPARATUS FOR HIGH IMPEDANCE RINGER DETECTION	SCHMIDT, KURT E.
<u>08918475</u>	6002729	150	08/26/1997	METHOD FOR FRAME SYNCHRONIZATION	SCHMIDT, KURT
<u>08805841</u>	6004276	250	03/03/1997	OPEN ARCHITECTURE CARDIOLOGY INFORMATION	SCHMIDT, KURT

				SYSTEM	
<u>08371734</u>	<u>5644617</u>	150	01/12/1995	METHOD AND APPARATUS FOR TESTING CABLES	SCHMIDT, KURT E.
<u>08311802</u>	<u>5699402</u>	150	09/26/1994	METHOD AND APPARATUS FOR FAULT SEGMENTATION IN A TELEPHONE NETWORK	SCHMIDT, KURT E.
<u>08188620</u>	<u>5517070</u>	150	01/27/1994	DRIVE UNIT, IN PARTICULAR AN ELECTROMOTIVE WINDOW - LIFT DRIVE FOR A MOTOR VEHICLE	SCHMIDT, KURT
<u>08178472</u>	Not Issued	163	01/05/1994	MAGNETIC TAPE CASSETTE HOUSING, WITH PLANAR INTERIOR AND INTEGRALLY MOLDED RAISED EXTERNAL CONTOURS	SCHMIDTS, KURT
<u>07885688</u>	<u>5227022</u>	150	05/19/1992	PROCESS FOR INCREASING PULP BRIGHTNESS WITH ZEOLITES AND EASILY DECOMPOSABLE ORGANIC CHELATING AGENTS	SCHMIDT, KURT
<u>07793410</u>	<u>5329198</u>	150	01/10/1992	SLIP RING OR COMMUTATOR MOTOR	SCHMIDT, KURT
<u>07395018</u>	<u>4953833</u>	250	08/17/1989	HYDRAULICALLY DAMPING ELASTIC BEARING	SCHMIDT, KURT
<u>06874832</u>	<u>4709288</u>	150	06/16/1986	ADJUSTING MEANS IN PARTICULAR FOR GUIDE ELEMENTS, AND MAGNETIC TAPE CASSETTE POSSESSING SUCH MEANS	SCHMIDTS, KURT
<u>06851879</u>	<u>4697794</u>	150	04/11/1986	RUBBER MOUNTING WITH HYDRAULIC DAMPING	SCHMIDT, KURT
<u>06562232</u>	Not Issued	166	12/16/1983	RUBBER MOUNTING WITH HYDRAULIC DAMPING	SCHMIDT, KURT
<u>06160100</u>	<u>4371158</u>	150	06/16/1980	SHEET TILTING SUCTION TYPE SEPARATOR	SCHMIDT, KURT

[Search and Display More Records.](#)

<b>Search Another: Inventor</b>	<b>Last Name</b>	<b>First Name</b>	<input type="button" value="Search"/>
	<input type="text" value="SCHMIDT"/>	<input type="text" value="KURT"/>	

To go back use Back button on your browser toolbar.

Back to [PALM](#) | [ASSIGNMENT](#) | [OASIS](#) | [Home page](#)